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Dec 14, 1999

DERWENT-ACC-NO: 2000-129327

DERWENT-WEEK: 200013

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TITLE: Manufacturing method of micro-lens substrate with black matrix for liquid crystal panel - involves irradiating light of predefined wavelength onto negative mold resist layer using microlens formed on back surface of substrate as optical system

PATENT-ASSIGNEE:

| ASSIGNEE | CODE |
|------------------|------|
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PRIORITY-DATA: 1998JP-0084762 (March 30, 1998)

PATENT-FAMILY:

| PUB-NO | PUB-DATE | LANGUAGE | PAGES | MAIN-IPC |
|---------------|-------------------|----------|-------|------------|
| JP 11344602 A | December 14, 1999 | | 022 | G02B003/00 |

APPLICATION-DATA:

| PUB-NO | APPL-DATE | APPL-NO | DESCRIPTOR |
|--------------|-------------------|----------------|------------|
| JP 11344602A | February 19, 1999 | 1999JP-0041682 | |

INT-CL (IPC): B29D 11/00; G02B 3/00; G02B 5/00

ABSTRACTED-PUB-NO: JP 11344602A

BASIC-ABSTRACT:

NOVELTY - Light (140) of predefined wavelength is irradiated onto the negative mold resist layer (130) using the microlens as an optical system to the photosensitive portion (131). A shading film (132) is formed on the resist layer and the photosensitive portion is removed to form black matrix (102) with an opening (104), by lift-off technique.

DETAILED DESCRIPTION - The negative mold resist layer (130) is formed on the surface of the substrate (100) with microlens (101) on its back surface. The light irradiated from the back surface of the substrate is parallel light or diffused light. The wavelength of the light during exposure of the negative mold resist layer is different from wavelength of light during usage of the microlens substrate. The substrate is formed with distance regulating unit which specifies distance with the black matrix. The black matrix is also formed by gaseous phase film forming technique. The opening shape of the black matrix is enlarged or corrected by photolithography.

USE - For manufacturing microlens substrate with black matrix for liquid crystal (LC) panel used in LC projector.

ADVANTAGE - Simplifies correct aligning of microlens and opening of black matrix thereby improves yield. Facilitates to manufacture black matrix without being limited to surface shape such as concave or convex curved surface of microlens.

DESCRIPTION OF DRAWING - The figure depicts drawing explaining manufacturing process of the microlens substrate MR black matrix. (100) Substrate; ; (101)

Microlens; ; (102) Black matrix; ; (130) Negative mold resist layer; ; (104)
Opening; ; (131) Photosensitive portion; ; (132) Shading film; ; (140) Light.

CHOSEN-DRAWING: Dwg.1/13

TITLE-TERMS: MANUFACTURE METHOD MICRO LENS SUBSTRATE BLACK MATRIX LIQUID CRYSTAL
PANEL IRRADIATE LIGHT PREDEFINED WAVELENGTH NEGATIVE RESIST LAYER FORMING BACK
SURFACE SUBSTRATE OPTICAL SYSTEM

DERWENT-CLASS: G06 L03 P81 U11 U14

CPI-CODES: G06-D04; G06-G18; L03-G05B;

EPI-CODES: U11-C18D; U14-K01A1C;

SECONDARY-ACC-NO:

CPI Secondary Accession Numbers: C2000-040032

Non-CPI Secondary Accession Numbers: N2000-097484